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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/699,256	10/30/2003	Chih-Chen Cho	500982.02 (30016/US/2)	9603

27076 7590 06/30/2005

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EXAMINER

THOMAS, TONIAE M

ART UNIT	PAPER NUMBER
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2822

DATE MAILED: 06/30/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/699,256	CHO ET AL.	
	Examiner	Art Unit	
	Toniae M. Thomas	2822	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 March 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 and 25-44 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-18 and 25-44 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>10/30/03</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This action is a first Office action on the merits of Application Serial No. 10/699,256, which is a continuation of Application Serial No. 09/945,077 filed on 30 August 2001, now US Patent No. 6,730,553.
2. The preliminary amendment filed on 30 October 2003 cancelled claims 19-24 and 45-49. Currently, claims 1-18 and 25-44 are pending.

Election/Restrictions

3. Applicant's election without traverse of Group I claims, 1-18 and 25-44, in the reply filed on 23 March 2005 is acknowledged. Claims 19-23 drawn to a nonelected invention were cancelled in the preliminary amendment filed on 30 October 2003.

Specification

4. The disclosure is objected to because of the following informalities: --now US Patent No. 6,730,553-- should be inserted on page 1 of the specification under the heading "CROSS-REFERENCE TO RELATED APPLICATION" after "August 30, 2001." Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

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(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. *Claims 1-4, 6-8, 11-16, 25-30, 32-36, 38, 39, and 44 are rejected under 35 U.S.C. 102(b) as being anticipated by Hashimoto et al. (US 6,069,038).*

The Hashimoto et al. patent (Hashimoto) discloses a method for making a semiconductor structure having an array area and a periphery area (figs. 3-18 and accompanying text). The method comprises forming a transistor in the array area and a transistor in the periphery area (fig. 6); forming a stopping layer 21 over the transistors (fig. 16); forming over the stopping layer a nonconductive layer 22 (fig. 16); forming openings 31, 32, 33, 34 by etching the nonconductive layer and the stopping layer (fig. 17); and forming a metallization layer 36 by filling the openings (fig. 18).

The metallization layer 36 comprises a barrier layer and a conductive layer (col. 12, lines 58-64).

The gate structure of the transistor comprises a gate oxide material 5, a polycrystalline silicon material 8, a conductive material 8, and a cap dielectric material 9 (fig. 4 and col. 9, lines 31-39). The conductive material may include a conductive material and a barrier layer (col. 9, lines 48-51).

The polycrystalline silicon may be a dual doped polycrystalline silicon layer (col. 9, lines 39-47).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. *Claims 5, 9, 10, 17, 18, 31, 37, and 40-43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hashimoto et al. in view of Cederbaum et al. (US 5,320,975).*

Hashimoto lacks anticipation of: filling the trench with a silicide, and forming the thickness of the etching stopping layer to a thickness of 300 angstroms.

The Cederbaum et al. patent (Cederbaum) discloses a method that is compatible with Hashimoto (fig. 3H and accompanying text). The method comprises forming an opening 40a/41a, and filling the opening with a metallization layer 46, which comprises a silicide compound 42a/42b, a barrier layer 45, and a conductive layer 46 (fig. 3H and col. 5, line 61 – col. 6, line 3).

Since Hashimoto and Cederbaum are both from the same field of endeavor; the purpose for which Cederbaum et al. is relied upon would have been recognized in the pertinent art of Hashimoto et al. by one of ordinary skill in the art at the time the invention was made.

One having ordinary skill in the art would have been motivated to modify Hashimoto, at the time the invention was made, by forming a silicide layer as part of the metallization layer, as taught by Cederbaum, because the silicide layer lowers the resistivity of the ohmic contact between the barrier layer and a source/drain region.

Hashimoto does not teach forming the etching stop layer to a thickness of 300 angstroms. It would have been obvious to one having ordinary skill in the art, at the time the invention was made, to form the etching stop layer to a thickness of 300 angstroms, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum and workable ranges involves only routine skill in the art (*In re Aller*, 105 USPQ 233).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Toniae M. Thomas whose telephone number is (571) 272-1846. The examiner can normally be reached on Monday through Friday from 8:30 a.m. to 5:30 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amir Zarabian can be reached on (571) 272-1852. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

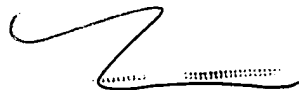
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TMT

26 June 2005

A handwritten signature in black ink, appearing to read 'Mary Wilczewski', with a stylized flourish at the end.

Mary Wilczewski
Primary Examiner